

**What Is Claimed Is:**

- 1           1. A system for providing high frequency data  
2 communications in a satellite-based communications network, the system  
3 comprising:  
4                 a plurality of communications satellites each having uplink and  
5 downlink antennas capable of receiving and transmitting a plurality of signals,  
6 each of said satellites having a communication control circuit;  
7                 at least one of said satellites being a reconfigurable satellite having,  
8                     a programmable frequency synthesizer coupled to a  
9                     communications control circuit;  
10                 a controller located on said satellite coupled to said  
11                     communications control circuit, said controller controlling a frequency  
12                     reconfiguration of said communications control circuit through said  
13                     programmable frequency synthesizer.
- 1           2. A system as recited in claim 1 wherein each of said satellites  
2 further comprising a beam forming network coupled to said uplink and downlink  
3 antennas.
- 1           3. A system as recited in claim 1 wherein said communications  
2 control circuit comprises an up converter and a down converter.
- 1           4. A system as recited in claim 1 wherein said communications  
2 control circuit comprises a transponder.
- 1           5. A system as recited in claim 4 wherein said transponder comprises  
2 an up converter and a down converter.
- 1           6. A system as recited in claim 1 wherein said communications  
2 control circuit comprises a time division multiple access switch.

1           7. A system as recited in claim 1 wherein said communications  
2 control circuit comprises a packet switch.

1           8. A system as recited in claim 1 wherein said plurality of  
2 communications satellites have an orbit selected from the group consisting of a  
3 LEO, MEO and GSO.

1           9. A payload circuit for a satellite comprising:  
2           a receive array;  
3           a receive beam forming network;  
4           a transmit array;  
5           a transmit beam forming network;  
6           a communications control circuit for controlling communications  
7 of satellite; and  
8           a reconfiguration circuit coupled to the communications control  
9 circuit for reconfiguring the communications control circuit.

1           10. A payload circuit as recited in claim 9 wherein said  
2 communications control circuit comprises an up converter and a down converter.  
*Sus*

1           11. A payload circuit as recited in claim 9 wherein said  
2 communications control circuit comprises a transponder.

1           12. A payload circuit as recited in claim 11 wherein said transponder  
2 comprises an up converter and a down converter.  
*10*

1           13. A payload circuit as recited in claim 9 wherein said  
2 reconfiguration circuit comprises a programmable frequency synthesizer coupled  
3 to said up converter and said down converter.  
*Gulf AB*

1        14. A payload circuit as recited in claim 9 wherein said  
 2 reconfiguration circuit comprises an on-board computer.

1        15. A payload circuit as recited in claim 14 wherein said  
 2 reconfiguration circuit comprises a routing table, said on-board computer  
 3 updating said routing table with reconfiguration data.

1        16. A payload circuit as recited in claim 9 wherein said  
 2 communications control circuit comprises a time division multiple access switch.

1        17. A payload circuit as recited in claim 9 wherein said  
 2 communications control circuit comprises a packet switch.

1 *JNO R&T*        18. A method of configuring a satellite system having a plurality of  
 2 satellites comprising the steps of:

3              deploying a reconfigurable satellite;  
 4              transmitting reconfiguration instructions to said satellite;  
 5              reconfiguring the payload of the reconfigurable satellite;  
 6              repositioning a satellite from a network position; and  
 7              moving the reconfigurable satellite into the network position.

1        19. A method as recited in claim 18 wherein the step of reconfiguring  
 2 a satellite comprises the step of changing the up converter frequency and down  
 3 converter frequency.

1        20. A method as recited in claim 19 wherein the step changing the up  
 2 converter frequency and down converter frequency comprises the step of  
 3 changing a frequency in a programmable frequency synthesizer.

1        21. A method as recited in claim 18 wherein the step of reconfiguring  
 2 a satellite comprises changing the amplitude or phase coefficients of a transmit  
 3 and receive beam.